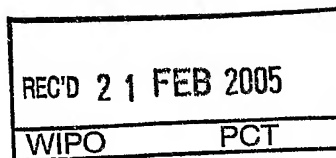




INVESTOR IN PEOPLE



The Patent Office  
Concept House  
Cardiff Road  
Newport  
South Wales  
NP10 8QQ

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Dated

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PCT/EP2004 / 013995

090EC03 EB58005-11 D00016  
P01/7700 0.00-0328438.7

**Request for grant of a patent**

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road  
Newport  
South Wales  
NP9 1RH

1. Your reference

DB/ESP03426/SCR

2. Patent application number

(The Patent Office will fill in this part)

0328438.7

8 DEC 2003

3. Full name, address and postcode of the or of each applicant (underline all surnames)

ESL HEALTHCARE LIMITED  
POTTS MARSH INDUSTRIAL ESTATE  
EASTBOURNE ROAD, WESTHAM  
EAST SUSSEX, BN24 5NH

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

GB

7032485002

4. Title of the invention

Improvements in or relating to shower drainage.

5. Name of your agent (if you have one)

BROOKES BATCHELLOR LLP

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

102-108 CLERKENWELL ROAD  
LONDON  
EC1M 5SA

Patents ADP number (if you know it)

08142291001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number  
(if you know it)

Date of filing  
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

YES

- a) any applicant named in part 3 is not an inventor, or
  - b) there is an inventor who is not named as an applicant, or
  - c) any named applicant is a corporate body.
- See note (d))

**Patents Form 1/77**

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Continuation sheets of this form

Description 4.

Claim(s)

Abstract

Drawing(s) 4. + 4 R

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

Request for substantive examination (*Patents Form 10/77*)

Any other documents  
(please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature

Brookes Hutchings

Date

December 2003

12. Name and daytime telephone number of person to contact in the United Kingdom

01892 510600

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**Patents Form 1/77**

## IMPROVEMENTS IN OR RELATING TO SHOWER DRAINAGE

5 The present invention relates to improvements in or relating to shower drainage. In particular, it relates to apparatus for use in draining water from shower trays.

Conventially, to drain water from a shower, a trap is provided below a drainage hole formed in the base of the shower tray. In general, the shower tray is placed at a height  
10 where the waste outlet can drain via an inclined pipe to the nearest waste water outlet.

When installing a shower tray for a elderly or disabled person the tray needs to be as low as possible to avoid any step. If possible completely level access is desirable. Once a tray has been fitted flush with the surrounding floor it is very difficult to  
15 achieve a gravity drain of the waste water, as it is normal for all the services in the bathroom to be connected above floor height to the main soil pipe to achieve the necessary gradient.

If gravity waste cannot be achieved, conventionally the shower tray will be connected  
20 to an electric pump. This pump is normally installed close to the shower tray and sucks the waste water from the tray and pumps it to the nearest waste water connection. These pumps tend to be large and noisy and so are intrusive.

Accordingly, there is a need for an improved system for removal of waste water from  
25 shower trays. It is with the above problems in mind that the present invention has been devised.

In its broadest sense, the present invention provides a shower waste water system comprising a sump for receipt of waste water from a shower and including an impeller chamber and a waste water outlet in fluid communication with the impeller chamber.  
30 The system also includes an impeller mounted for rotation within the impeller chamber.

Suitably, the impeller is driven by means of an electric motor, most suitably a low-voltage electric motor. Preferably, the motor is mounted above the sump.

Preferably, the system includes a sensor to sense the level of water in the sump, the  
5 impeller being caused to operate when the level of water reaches a pre-determined level.

The above and other aspects of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

10

Figure 1 shows a portion of a shower tray incorporating an embodiment of a system in accordance with the present invention;

Figure 2 shows the embodiment of Figure 1 with cover removed;

15

Figure 3 is a perspective view of the embodiment of Figure 1 removed from the shower tray;

Figure 4 is an exploded perspective view of the embodiment of Figure 3

20

Figure 5 is a cross-sectional view of the embodiment of Figure 3; and

Figure 6 is a cross-sectional view along line VI – VI in Figure 5.

25 Referring to Figure 1 there is shown a typical installation including the present invention, including a shower tray 10 and the waste removal system of the present invention largely obscured by a cover 11, to provide an aesthetically pleasing appearance. The cover is secured by suitable means, such as screws, to an  
30 receipt of impeller drainage assembly 12 and the tray is designed such that water falling onto the surface of the tray flows towards the aperture 13. The impeller/drainage assembly 12 includes an assembly body housing a low voltage electric motor 15 driving an impeller blade unit 20. The assembly further includes a

waste sump 21 sealably securable to the shower tray 10 by means of an O-ring seal 22 and locking nut 23. Sump 21 has a sump cover 24 having an impeller aperture 25 through which the drive shaft 30 of impeller 20 passes. The sump 21 has an impeller chamber 31 in which impeller 20 rotates. Impeller chamber 31 is of increasing diameter from a point 32 where the diameter of the chamber 31 is substantially the same as the diameter of the impeller blade unit 20 to a point where impeller chamber 31 expands to form an outlet 33 from the sump. Thus, with reference to the view shown in Figure 6, as the impeller is caused to rotate in a clockwise direction, water in the impeller chamber 31 is expelled through outlet 33.

The impeller/drainage assembly further includes a sensor 34 which senses when water in the sump reaches a pre-determined depth. The sensor forms a part of a control circuit conveniently housed, in the embodiment shown, in a circuit housing 35 at the upper end of the impeller/drainage assembly. The control circuit is suitably powered by a low voltage supply 40 from an external transformer (not shown). In response to a signal from sensor 34 that there is water in the sump and that it has reached a predetermined depth, the control circuit causes actuation of the impeller 20 by motor 15 thereby causing evacuation of the water from the sump by a centrifugal force. The outlet 33 is coupled to a suitable waste water system in a conventional manner. However, a non-return valve may be provided to prevent any back-flow of water.

In normal use impact with the user will interrupt the uniform flow of water, thereby causing the flow of water to vary in the sump. Sensor 34 will detect the level and switch off the pump when water is not present. This system will mean that the pump will switch on and off continuously to ensure that it only operates when needed.

Once the user has completed their shower it is normal for the water to take a while to completely drain away. The pump will continue to operate each time the sump is full of water.

Traditional pumps suck water from the tray. To avoid flooding of the tray, they have to operate at a rate greater than the shower. This means that air will also be sucked into the waste, creating an unpleasant noise. This invention avoids the sucking action

of existing arrangements, using a centrifugal force to move the water. The electronics also sense the water level and only activate the pump when water is present. The pump is therefore always moving only water.

- 5 Traditionally the pump is mounted near the shower tray. These pumps are quite large and look unsightly in the bathroom. They are also fixed to a wall, which can vibrate with the pump movement creating a noise when in operation. This invention sits in the waste of the shower tray. No external pump is fitted. This makes for an installation having a very neat appearance.

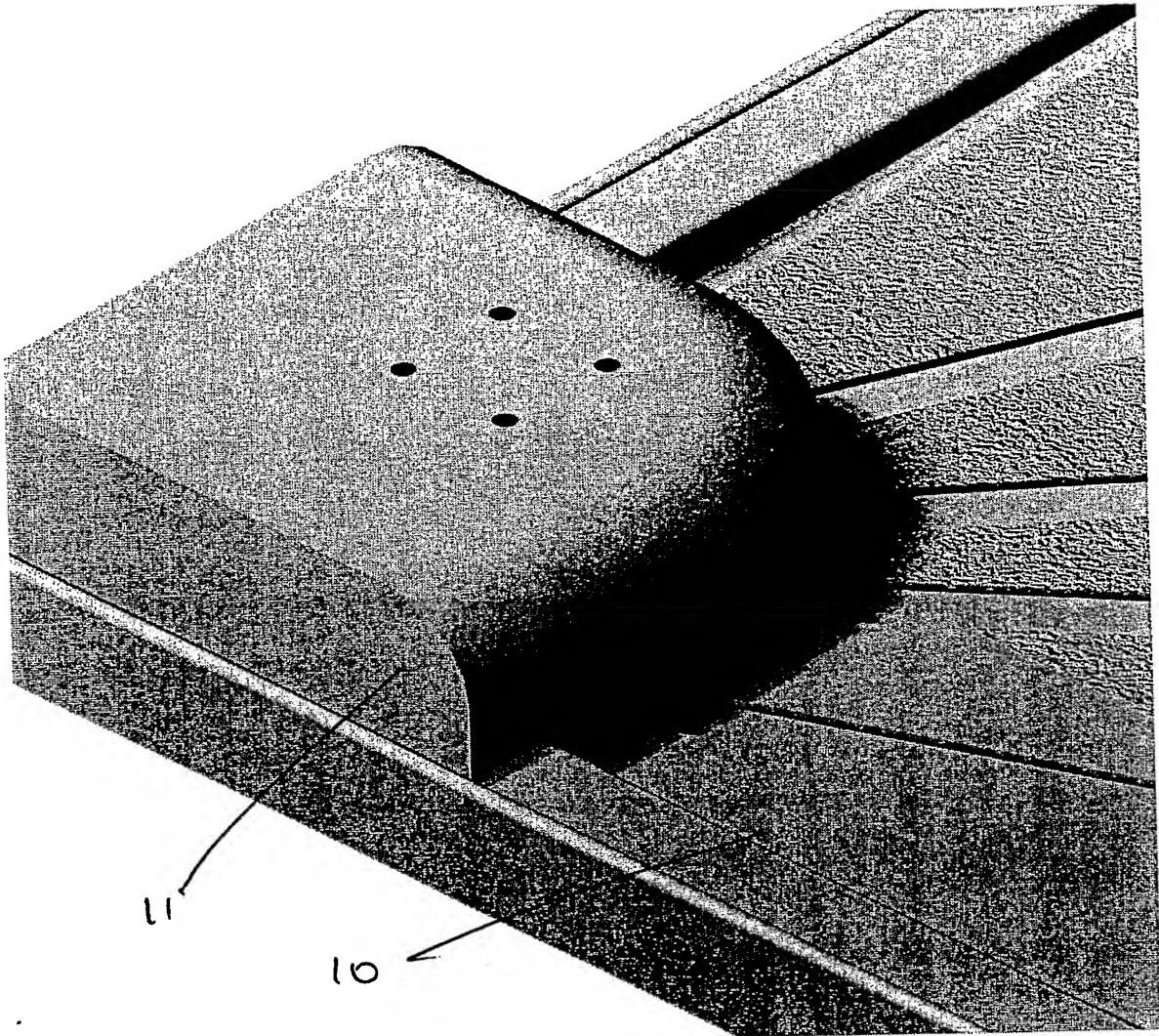


Figure 1.



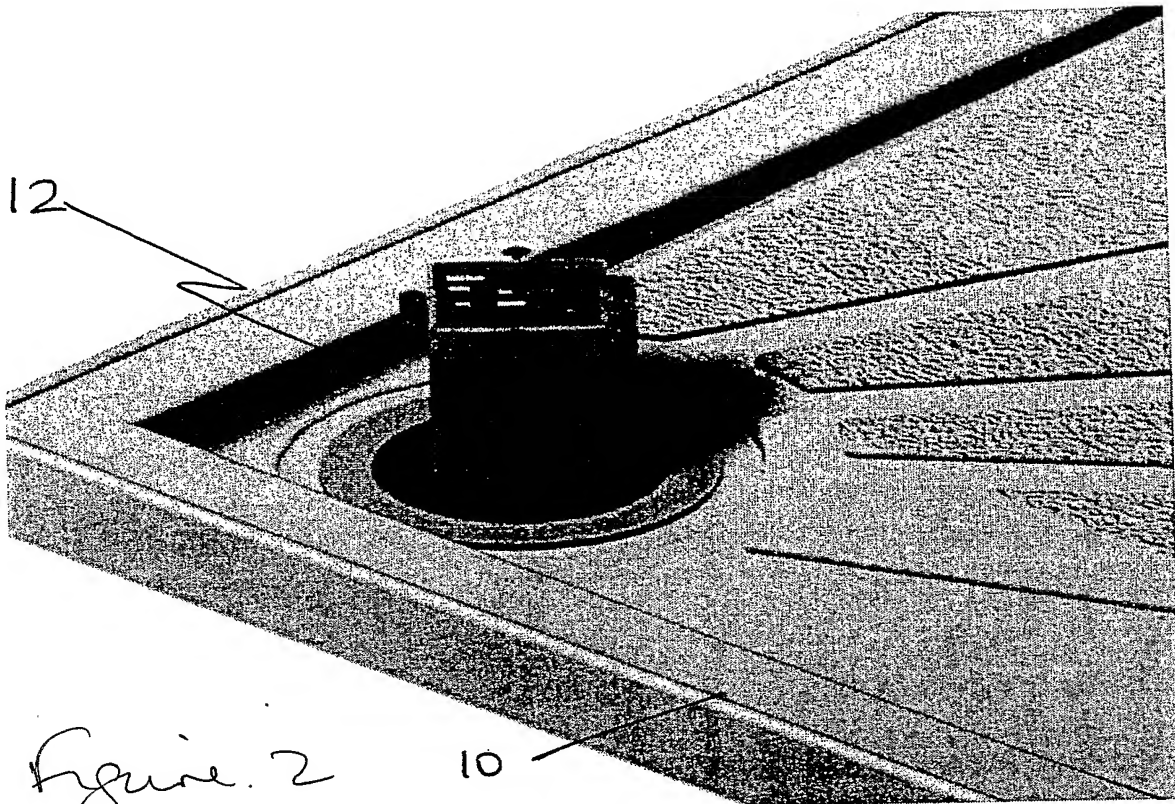


Figure 2

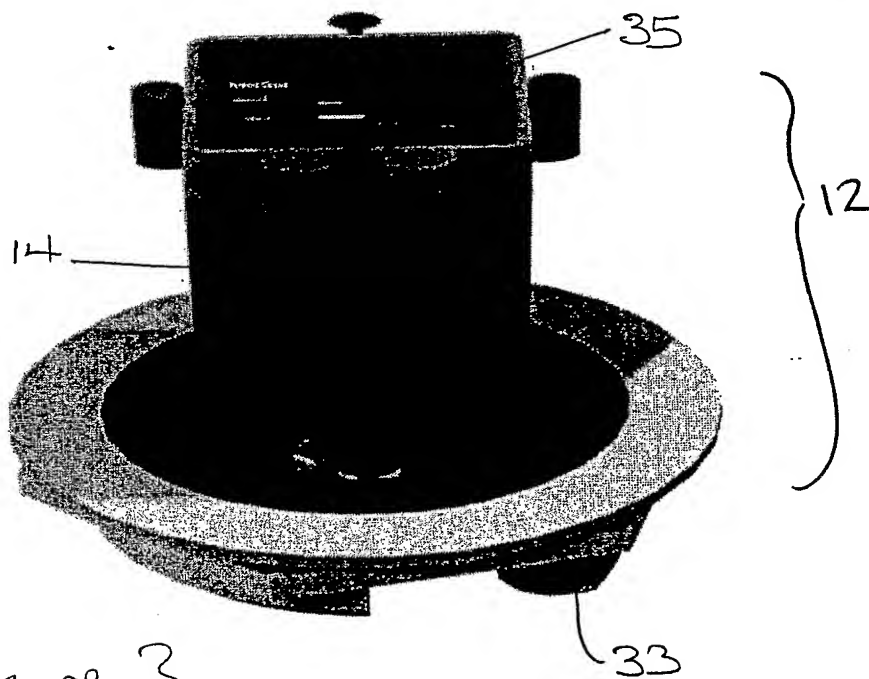


Figure 3

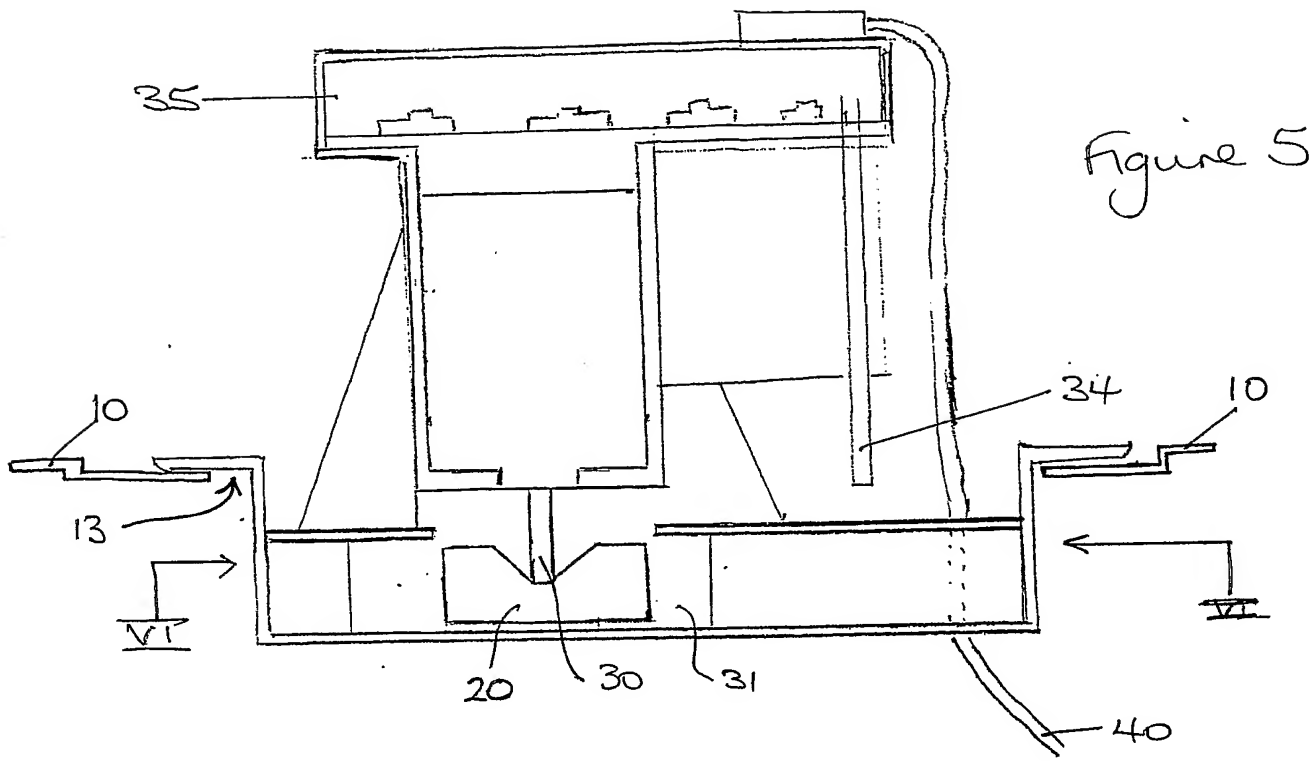


Figure 5

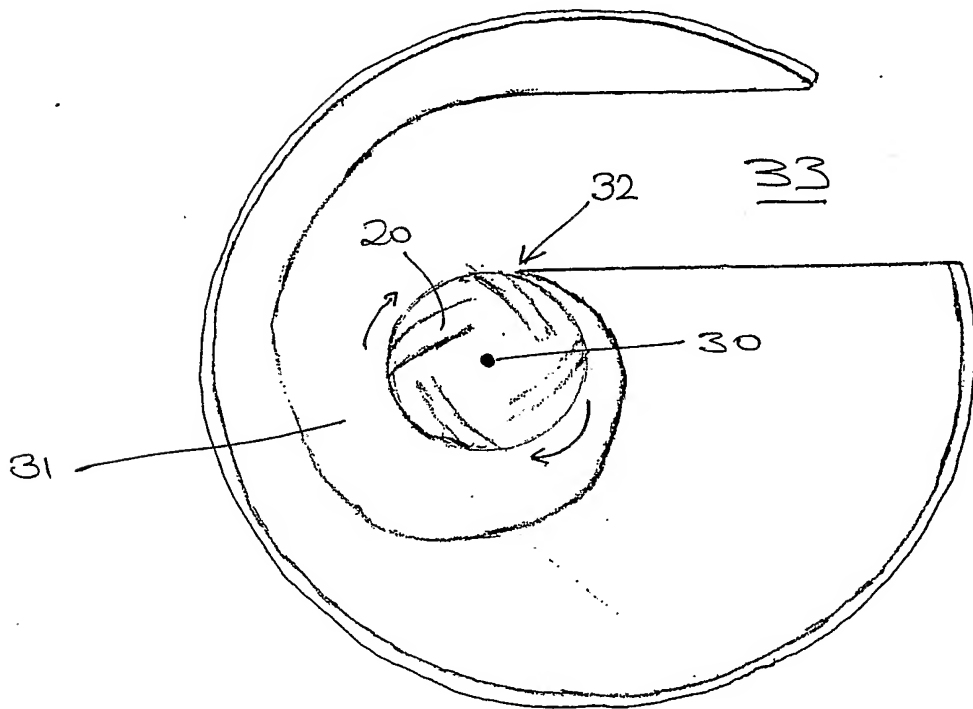


Figure 6.

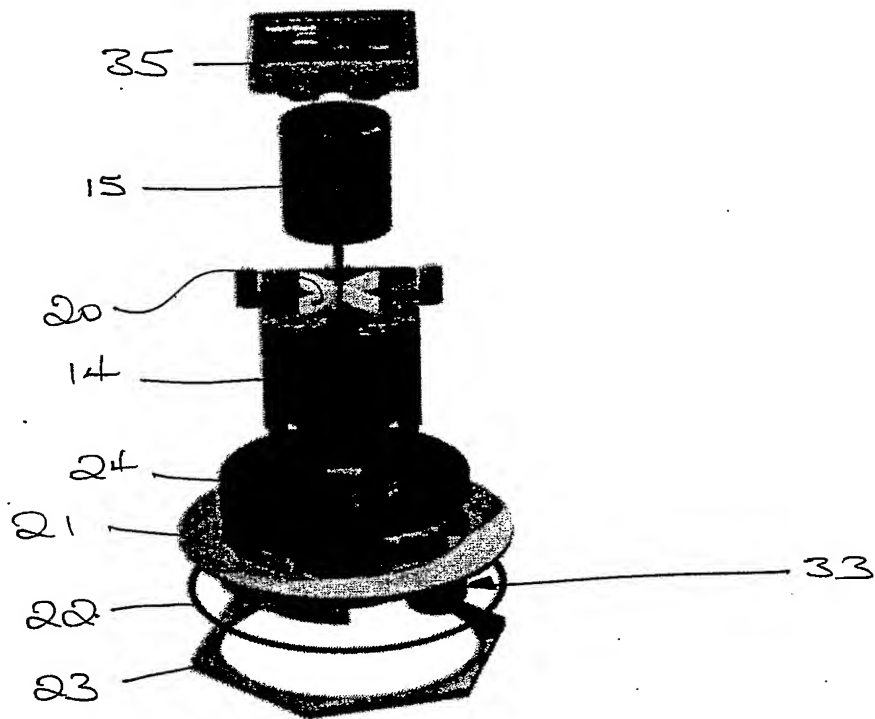


figure 4